Readiness Checklist

Audit of PSS G3 Milestone 1 **FINAL REPORT** T. Barsz – 11/24/2004

Tom,

Would you please perform an audit of the PSS Gen-3 readiness for Milestone #1 ("Simulated Operation"). I have attached the most recent readiness checklist for that milestone (it will also shortly be posted on the design review web page).

I have asked to have the next progress review during the week of November 15th, and wish to have the audit successfully completed in time for that meeting.

Thanks - John

Readiness Checklist for PSS Generation-3 at 30-ID
Milestone #1

Readiness for the PSS Generation-3 prototype at 30-ID comprises three distinct stages:

1. Design, installation, testing, and preparation for simulated operation (no front-end at 30-ID)
   a. **Milestone 1**: Ready for Simulated Operation.
2. Simulated operation of the Gen-3 prototype, where all aspects of the system will be exercised
   a. **Milestone 2**: Ready to take beam.
3. Initial tests with beam, floor coordinator and operator training, develop formal procedures, etc
   a. **Milestone 3**: Operations hand-over.

	Checklist for Milestone 1 - Part A	Completed	Approved	Current	DCC	Comments
1	Successfully pass an engineering Final Design Review	☒	NA	NA	NA	Final Design Review was completed4/27/04. See ASD Home Page
2	Written responses provided to reviewer comments from the Final Design report	☐	NA	NA	NA	Input is needed from Mohan. See item 6 of 10/12/04 Review Summary
3	Design approval granted from the APS Radiation Safety Policy & Procedure Committee	☐	NA	NA	NA	Pending results of 11/16/04 review.
4	Action items closed from PSS Gen-3 design and progress reviews	☐	NA	NA	NA	1. AOD needs to approve removal of ASD-SI's responsibility for ESD for the Beamline pneumatic pressure switches . 2. T. Barsz to creat method for controlling changes that may arise during commissioning.
5	Deliverables from the Statement of Work provided and verified	☐	NA	NA	NA	Appendix B of the SOW needs to be completed by ASD Mangement.
6	Approved Requirements document	☒	☒	☒	☒	Same documents listed in Part B

DONE
ARRANGE WITH LANG
BEAMLINE SHUTTER ICD
BARSZ ECR FORM
COMPLETE BY NEXT REVIEW

Readiness Checklist

	Checklist for Milestone 1 - Part A	Completed	Approved	Current	DCC	Comments
7	Approved Functional Description document	☒	☒	☒	☒	
8	Approved Interface Control document package	☒	☒	☒	☒	See Part C line 1
9	Approved Chain A Master Software Design document	☒	☒	☒	☒	See Part J line 1
10	Approved Chain B Master Software Design document	☒	☒	☒	☒	See Part J line 2
11	Approved Chain C Master Software Design document	☒	☒	☒	☒	See Part J line 3
12	Approved HMI Master Software Design document	☒	☒	☒	☒	See Part J line 4
13	Approved checkout procedure for making functional changes to non-ESD hardware and software (Chain-C PLC, HMI)	☒	☒	☒	☒	See Part L line 6
14	Complete package of approved engineering drawings and parts lists for 30-ID prototype	☒	☒	☒	☐	Drawings have not been submitted to DCC. See J. Hawkins about parts list.
15	Checkout of prototype printed circuit boards complete and documented	☒	☒	☒	☐	Records kept in unlocked file cabinet located in the ASD-SI Common Area
16	Offline hardware-in-the-loop simulator in place and operational	☒	☒	☒	☐	Operation and construction of the the 30-ID Simulator was during 9/9/04 Review.
17	Checkout of validation test boxes complete and documented	☐ DONE	☐	☐	☐	All but one drawing completed and approved. (Documentation not complete due to change in WBS numbers).
18	Installation, commissioning and shakedown testing of 30-ID prototype complete and documented	☒	☒	☐	☐	Commissioning cannot take place until approved by G3 Review Committee. Installation is complete. Shakedown was performed using 100-page I/O List.
19	All necessary jumpers and forces needed for simulated operation in place and documented.	☐ DONE	☐	☐	☐	Forces will not be required. Jumpers have not been completed.
20	ESD Chain validation completed using approved ESD (Chains A & B) validation package.	☒	☒	☒	☐	The orignal document needs to be reprinted and reapproved because it was used to record validation sign-offs.
21	Non-ESD verification completed using approved Non-ESD (Chain C and HMI) checkout package	☒	☒	☒	☒	Per documents listed in Part L.
22	Temporary front-end shutters hooked up and functional	☒	☐	☐	☐	Auditor witnessed @ Sector 30 on 11/15/04. Shutters wer were connected to the G3 System., but not operating at the time. Shutters connected using unapproved wiring diagram
21	Detailed test/operation plan provided for 30-ID for simulated operation period.	☒	☒	☒	☒	Included in Commissioning Plan listed in Part L.

Readiness Checklist

- The following issues apply to the Statement or Work: The document number (4104-00000-00) for the Project Schedule referred to in section 6 of the Statement of Work is incorrect. R. Emerson stated that D. Lichty is responsible for Project Schedule. D. Lichty disagreed with R. Emerson's statement and commented that the only schedule he has i one that was provoded to him months ago.

	Checklist for Milestone 1 - Part C **Interface Control Documents Baseline Documents from Gen-3 SOW Matrix (Emerson)** Date: 10/22/04	**Completed**	**Approved**	**Current**	**DCC**	**Comments**
1	4104-913051-00 Access Control Interlock System (ACIS) interface	☒	☒	☒	☒	
2	4104-212015, 212016,212080,212086,212087	☒	☒	☒	☐	21280 should be listed as 21281
3	4104-913054-00 Front End Shutters interface	☒	☒	☒	☒	
4	4104-212017,212018,212020212081,212082	☒	☒	☒	☐	
5	4104-913055-00 Beamline Shutters interface	☒	☒	☒	☐	Awaiting approval by S. Sharma or P. DenHartog.
6	4104-210155 **INTEGRAL SHUTTER DRAWINGS** **DONE**	☐	☐	☐	☐	Awaiting drawings from Mohan.
7	4104-913052-00 Front End Equipment Protection System (FE-EPS) interface **ICD DONE**	☐	☐	☐	☐	Cannot be completed until requirements are provided by Mohan.
8	4104-212020	☒	☒	☒	☐	
9	4104-913053-00 Beamline Equipment Protection System (BL-EPS) interface	☒	☒	☒	☒	
10	4104-210106,210206,210306	☒	☒	☒	☐	
11	4104-913056-00 DIW (De-Ionized Water) interface	☒	☒	☒	☒	
12	4104-2120219,212052, 212053, 212062, 212113	☒	☒	☒	☐	212113 was changed to 212225
13	4104-913124-00 Human Machine Interface (HMI)	☒	☒	☒	☒	should be listed as 913057
14	4104-212025,212061	☒	☒	☒	☐	212025 &212061 have been incorporated into 913110
15	4104-913058-00 EPICS interface	☒	☒	☒	☒	
16	4104-212054,212062	☒	☒	☒	☒	212054 was deleted

Summary of audit results for Part C:

The checkboxes appearing in the DCC column were independently verified by DCC.

The auditor was told that all PSS G3 drawings have been approved, but not yet incorparated into the APS DCC.

The auditor was told that all drawings represent what has been actually installed.

Readiness Checklist

All drawings had approval signatures . The date of the SI Group Leader's signature on all of the drawings was observed to range from 10/14/04 -11/09/04..

Nearly all drawings were at the Pro/Intralink Engineering Release level. Several of the most recently approved drawings were at the Pro/Intralink Pending Release level.

Several of the drawings reviewed had different approval dates for the same revision. The Designer stated that this practice is in accordance with APS policies in that the revision number is not changed unless the drawing has been submitted to DCC.

The Designer stated that she was the only person allowed to make changes to the drawings. This practice was confirmed by the SI employee assisting the auditor with the review of the temporary Shutter installation at 30 ID.

Drawings 4104-210155 & 4104-250255 cannot be completed without assistance from Mohan Ramanathan.

Drawing 41043002-21280 appearing the 30 ID Drawing List (document no. 41043002-210001-00) should be listed as a reference, since it is part of the ACIS System.

Drawing 41043002-212127 does not appear on the above drawing list.

Drawing 41043002-21290 needs editing

Drawing 41043002-212245 is incorrect

Drawings 41043002-212236 and 41043002-212114 were not present for the auditor's review

The ASD-SI Group's installation the G3 system at 30-ID prior to design approval is in conflict with section 6.0 of the APS QA Plan: "Verification and validation of work shall be completed before approval and implementation of design."

	Checklist for Milestone 1 - Part D **PSS Mezzanine Controls Baseline Documents from Gen-3 SOW Matrix (Emerson)** Date: 10/22/04	**Completed**	**Approved**	**Current**	**DCC**	**Comments**
1	104-212005 – 4104-212134	☐	☐	☐	☐	

DONE

Summary of audit results for Part D:

These drawings are not completed and confirmed to not be in the APS DCC.

The ASD-SI Group's installation the G3 system at 30-ID prior to design approval is in conflict with section 6.0 of the APS QA Plan: "Verification and validation of work shall be completed before approval and implementation of design."

Readiness Checklist

	Checklist for Milestone 1 – Part E PSS Station Controls Baseline Documents from Gen-3 SOW Matrix (Emerson) Date: 10/22/04	Completed	Approved	Current	DCC	Comments
1	4104-210000 – 4104-210385	☐ DONE	☐	☐	☐	

Summary of audit results for Part E:

These drawings are not completed and confirmed to not be in the APS DCC.

	Checklist for Milestone 1 – Part F Manual Validation Test Adapters Baseline Documents from Gen-3 SOW Matrix (Emerson) Date: 10/22/04	Completed	Approved	Current	DCC	Comments
1	410497-913100-00Validation System Functional Description for the Generation 3 Personnel Safety System	☒	☒	☒	☒	
2	410497- 913030-00 Validation System Input/Output Listing for the Generation 3 Personnel Safety System	☒	☒	☒	☒	
3	410497-913020-00 Validation System Requirements for the Generation 3 Personnel Safety System	☒	☒	☒	☒	
4	410497-913220-00 Validation System Validation for the Generation 3 Personnel Safety System	☒	☒	☒	☒	

Summary of audit results for Part F:

The checkboxes appearing in the DCC column were independently verified by DCC

	Checklist for Milestone 1 – Part G Test Cart, Station Test Box Cutout and Wiring, Test Box Test Adapter from Gen-3 SOW Matrix (Emerson) Date: 10/22/04	Completed	Approved	Current	DCC	Comments
1	410497-212136,212146, 212147, 212148,212232, 212246, 212247, 212248 Test and Validation	☒	☒	☒	☐	

30ID Status

- Software, Validations and Procedures
- Mezzanine and Station Boards
- EPICS
- Validation Equipment
- Carwardine “Show Me” successful
  - Requirements doc review

Software

- S30 Code done but not tested with new boards
- Validation Cart code must be done before 1/10 (changes to match new board)

Validations

- 3 full validations have been completed
  - Only 1 in December
- Progress being hampered by construction
  - Only had about 5 full days since Thanksgiving
- Installation of new boards, wiring changes and front-end 1/10 – 1/14
- Validations with new boards 1/10 – 1/21
- Group training 1/24 –1/28
  - Must coordinate with shutdown
- All other training to follow (FC's, Users, etc.)

Validation Procedures

- Fine tuning after initial validations
  - Creating common naming convention (SOW)
- Revised to match new boards
- Final documentation updates 1/17 – 1 /21
- Continue making minor changes as others perform validations

Mezzanine and Station Boards

- Ordered
  - 15 Station Boards & 5 Mezzanine Boards
- Stuffed (Gary Crews)
  - 9 Station Boards & 3 Mezzanine Boards
  - S30ID, S26ID and Lab/Spares
- Remaining boards being stuffed by CIS
  - Due in January

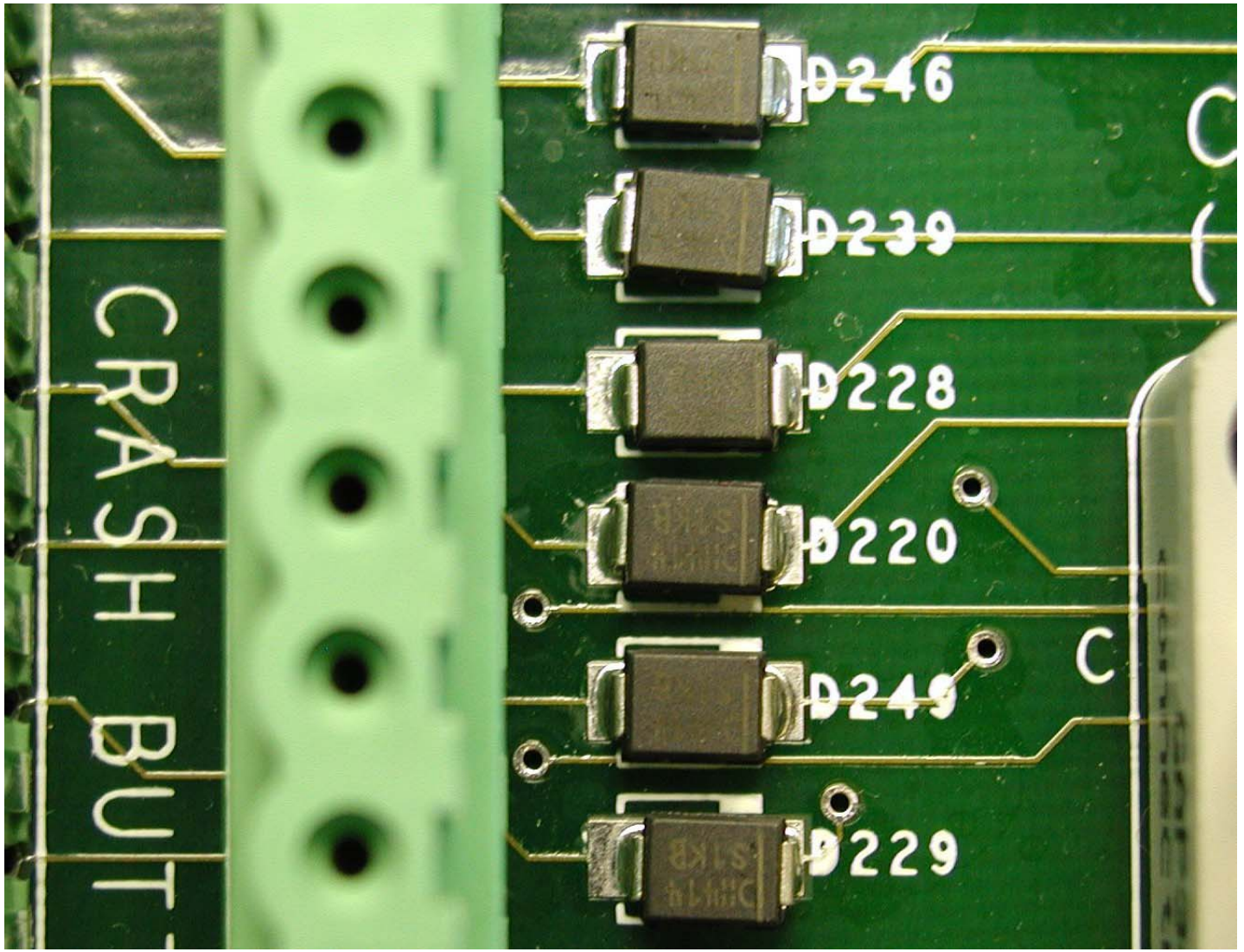
Mezzanine and Station Boards

- Testing (using Ken's procedure)
  - 1 Mezzanine board done
  - 3 Station boards done
  - To be used in S30
- Remaining boards to be tested as time permits
  - S26 1-Mezzanine 3-Station
  - Lab/Spare 1-Mezzanine 3-Station

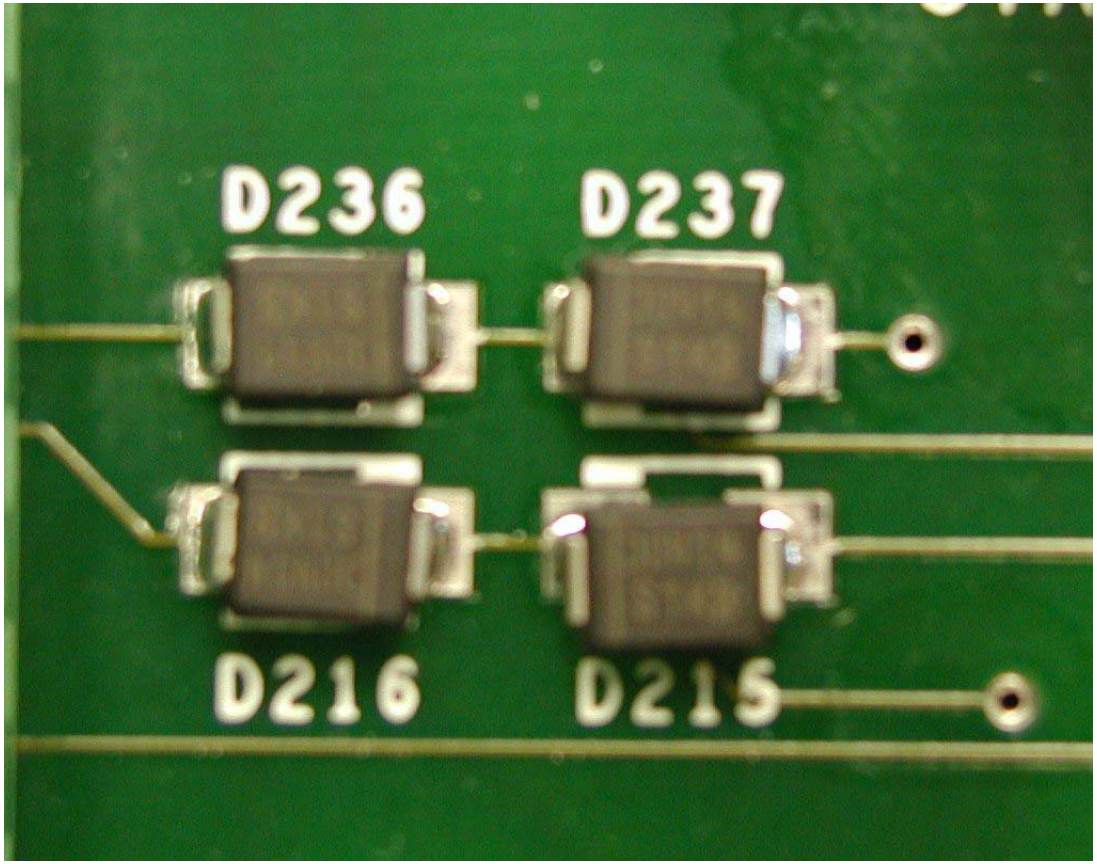
Mezzanine and Station Boards

- Quality
  - Boards look good
  - Stuffing by Gary Crew
    - Acceptable only because we need boards
    - Not Class 2 (but not spec'd class 2)
  - Waiting to see quality from CIS
- 2 minor mistakes found
  - Missing Trace (easy fix)
  - Station board Silk screen

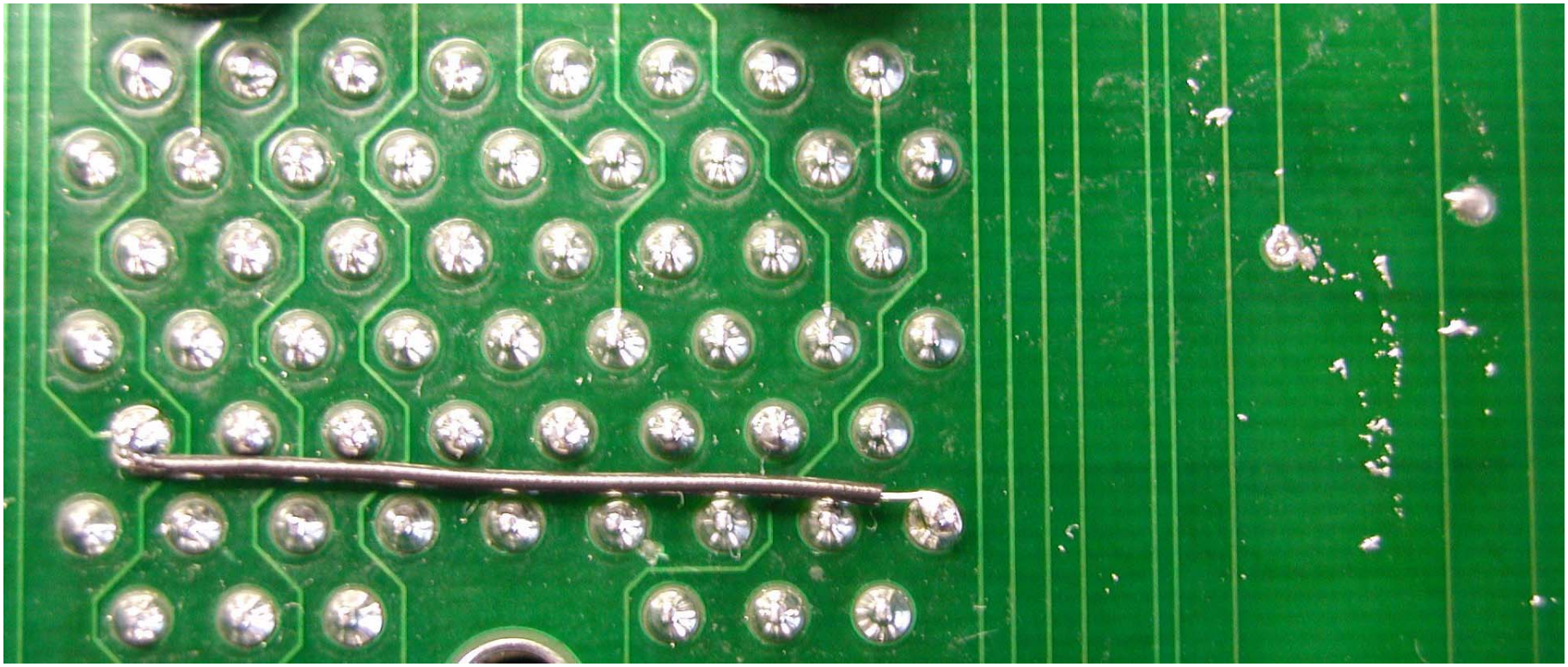
Class 2?



Class 2?



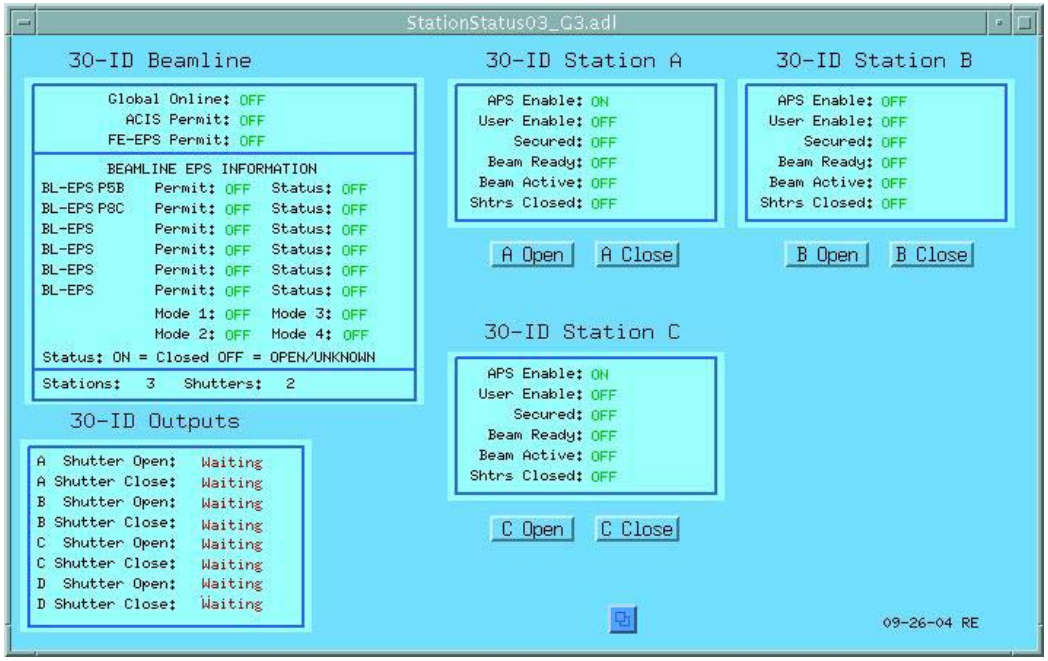
Class 2?

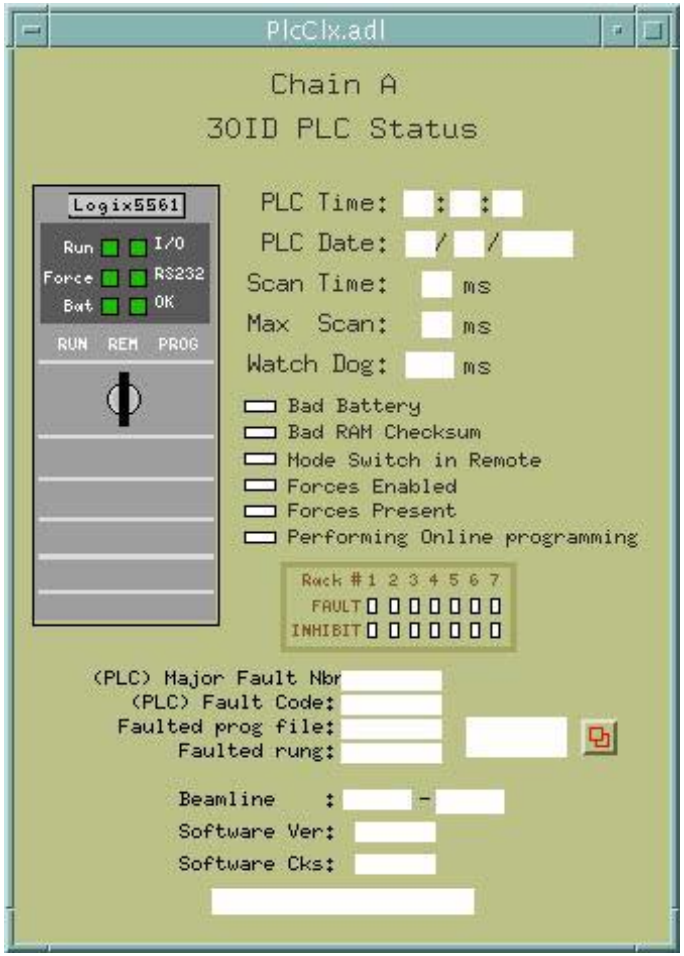


EPICS

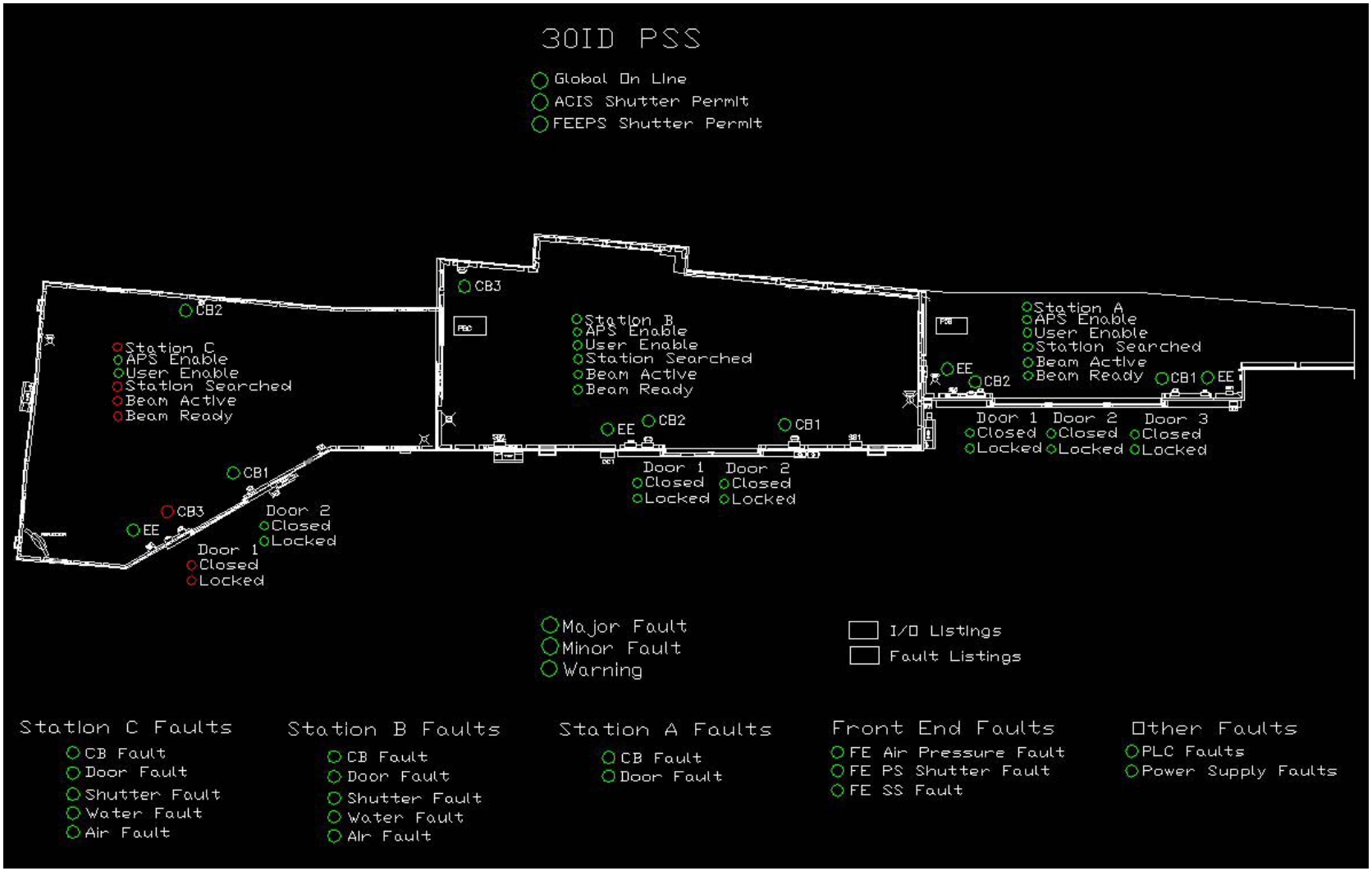
- Roy is continuing to work on screens
- Screens are not working as of this writing
- Old style screens are being used now
- Phil and Greg are developing new user friendly screens similar to S31ID FEEPS
- Roy and Marty will implement

Old EPICS Main Screen

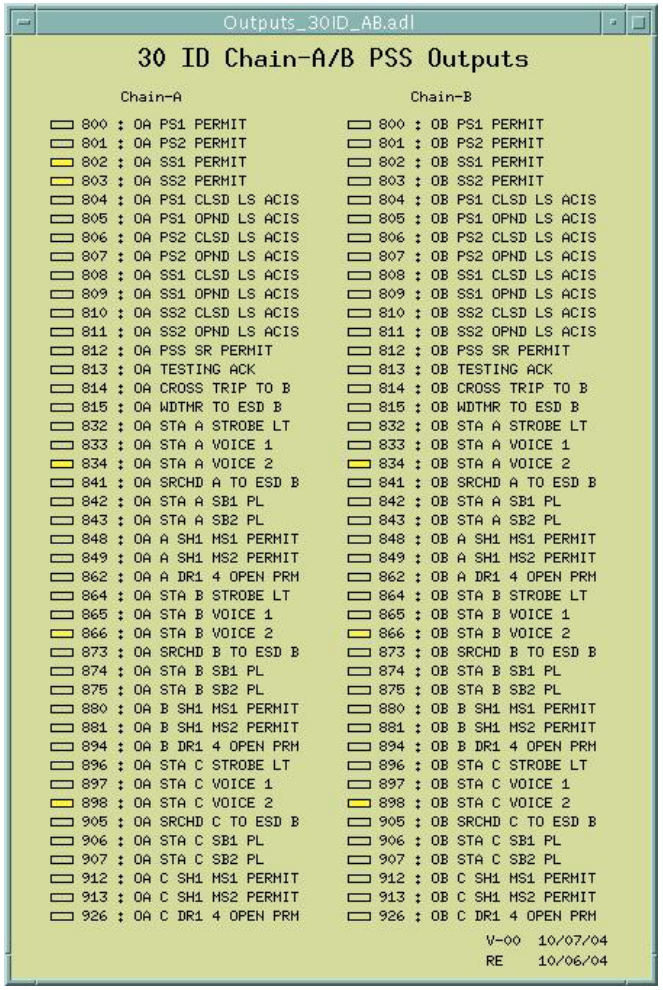


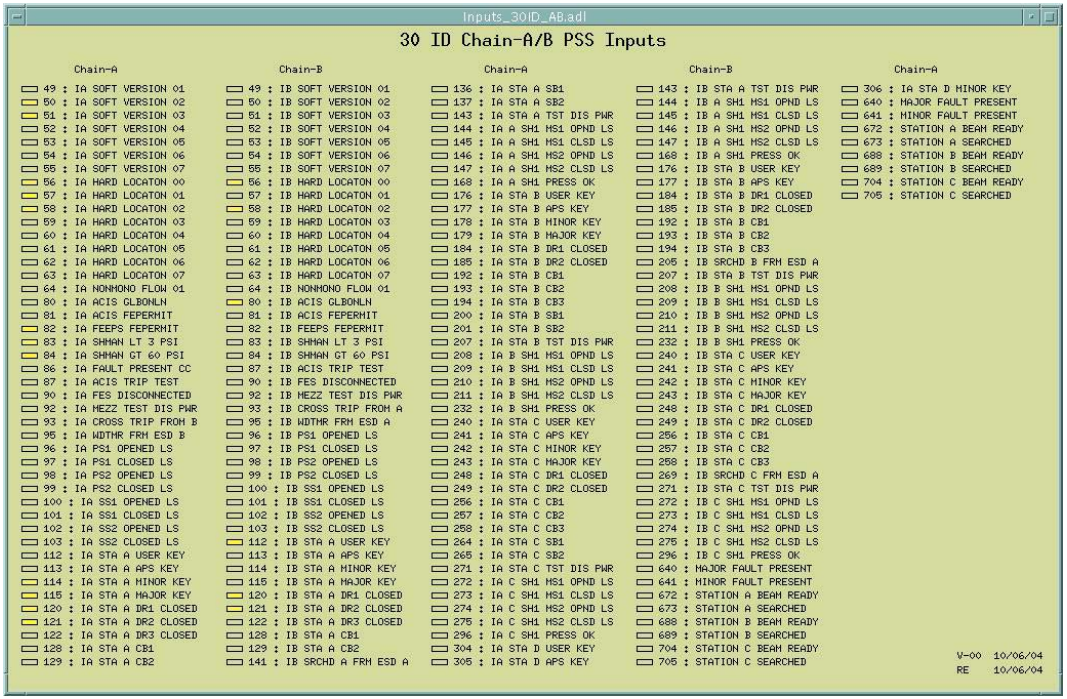


New EPICS Main Screen

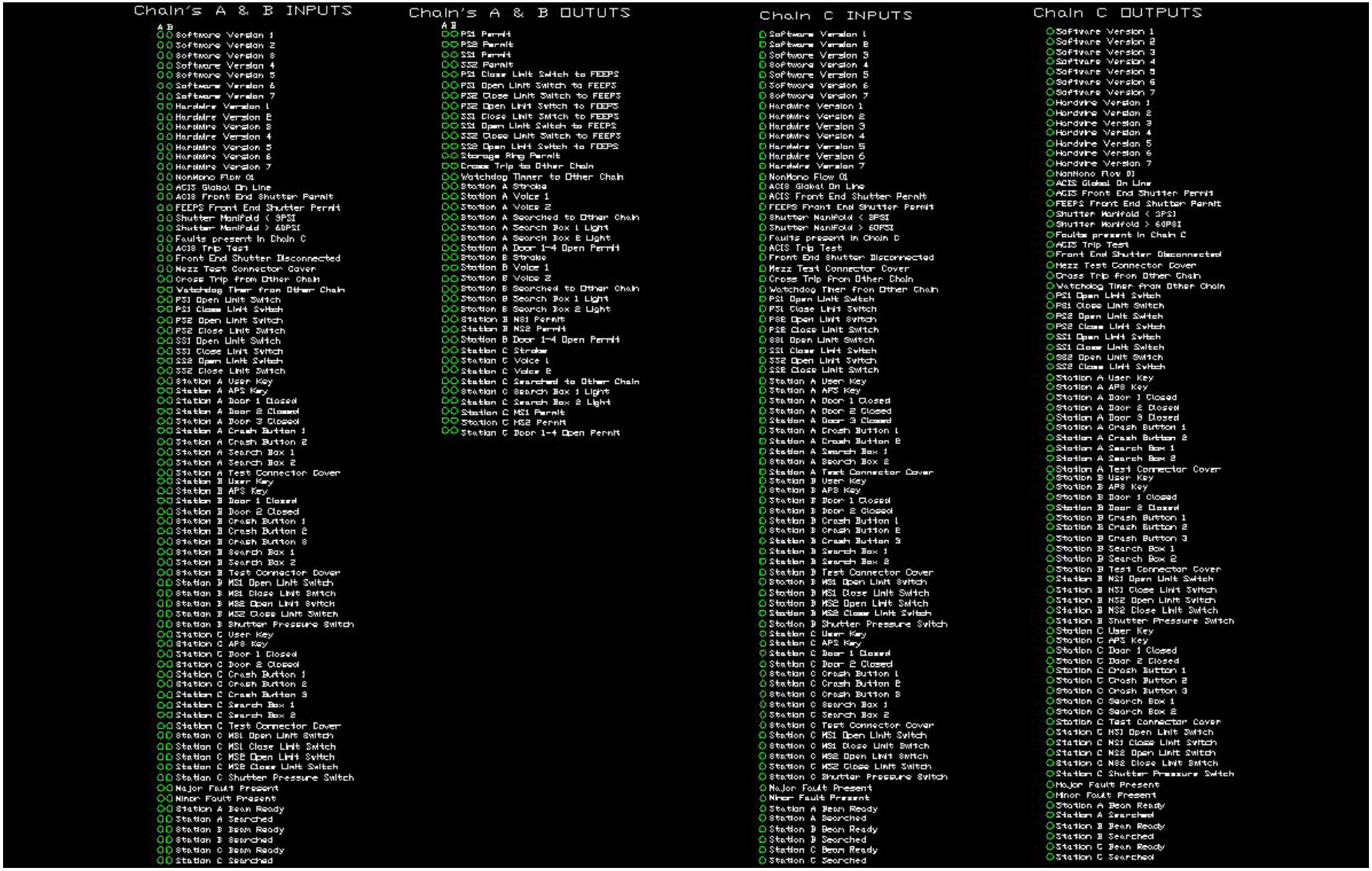


Old I/O Screens

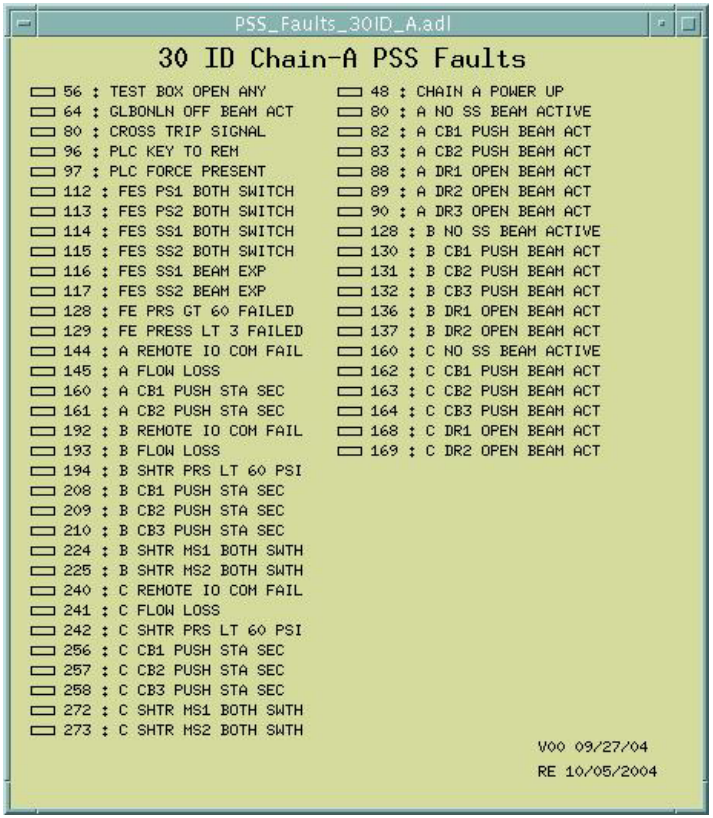


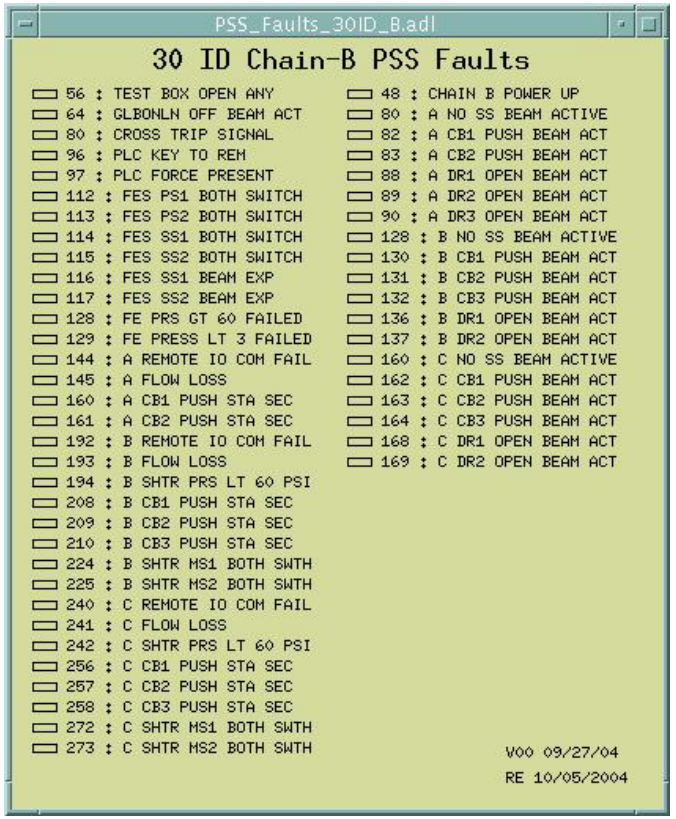


New I/O Screen

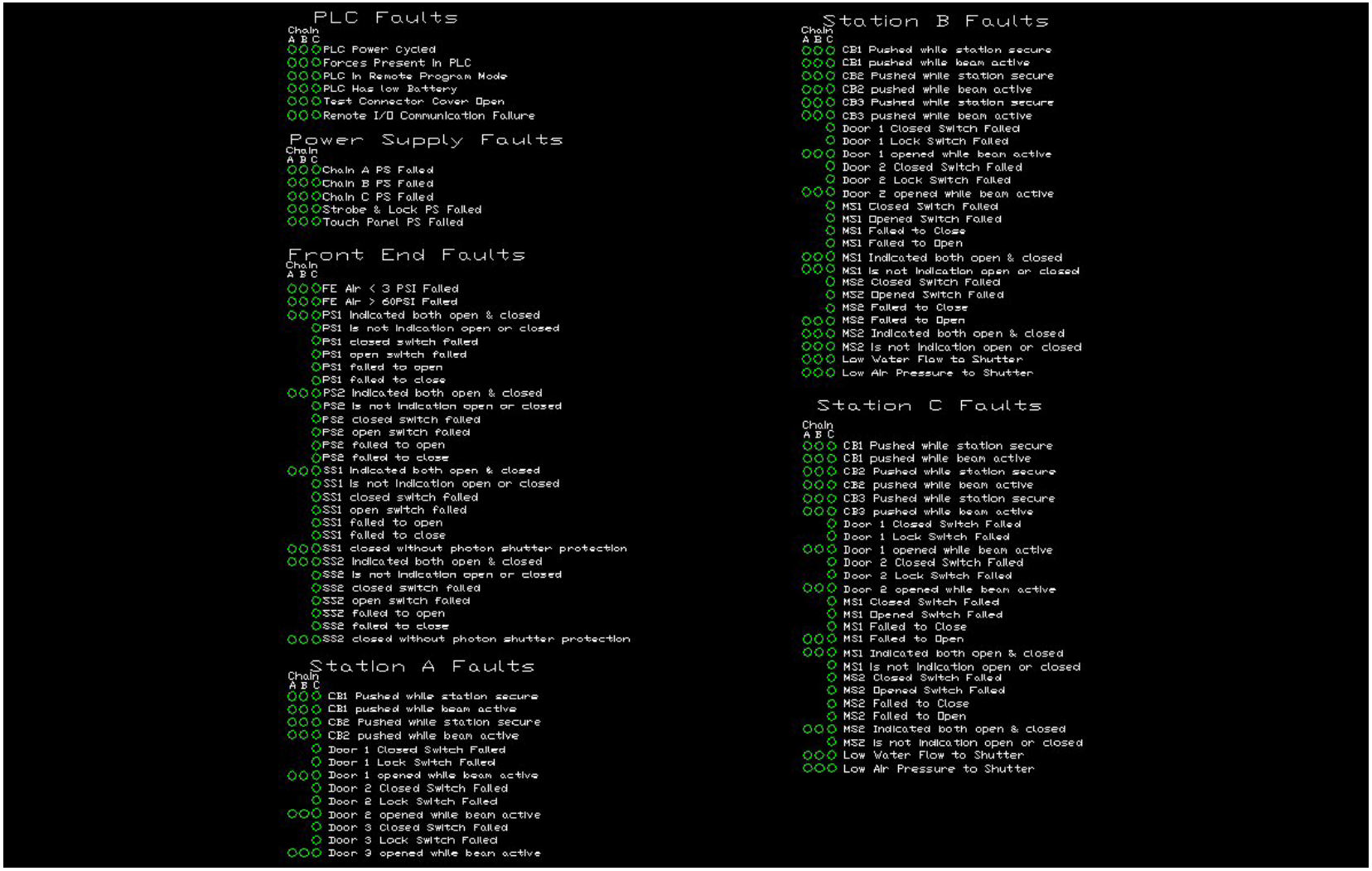


Old Fault Screens

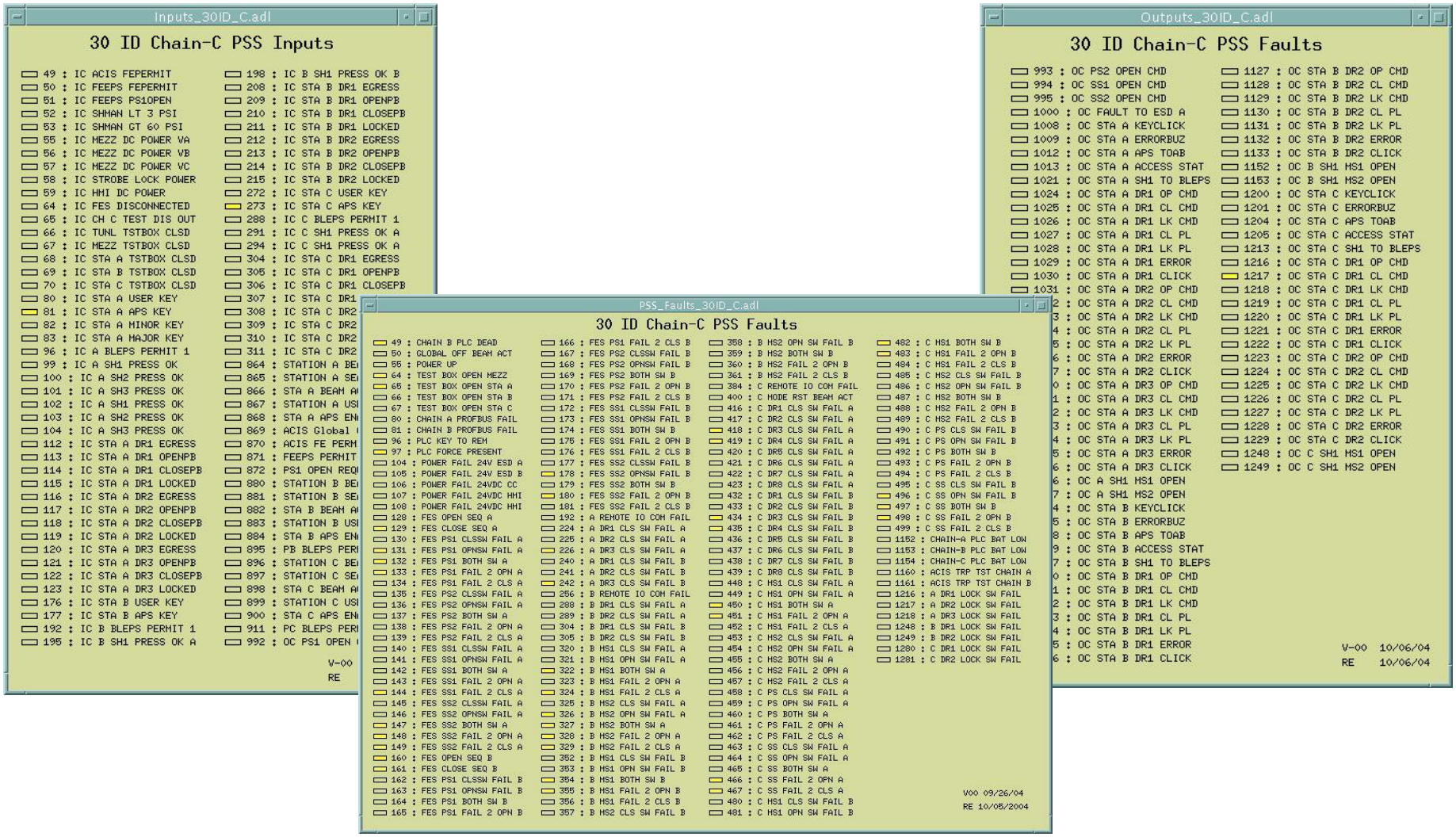




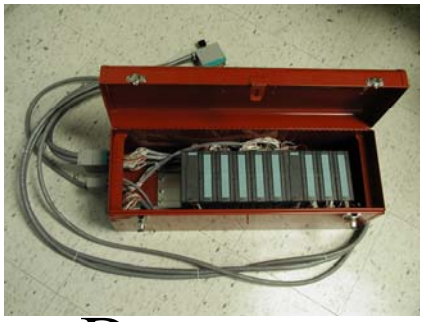
New Fault Screen



Existing Chain C Screens



Validation Equipment



- Existing
  - Maytag
  - Mezzanine Test Box
  - 3 Station Test Boxes
- No Spares
  - We do have parts for 1 Test Box (need 2)
  - Plan to build with different enclosure
  - Spare cables also need to be fabricated

Sector 26 Gen 3 Installation

- Installation progressing using S30ID drawings
- Documentation and drawings are the same with only minor changes
- Full package will be assembled in February
- Parts 95% Install 2%
- BLEPS – Got requirements list 12/23
- FEEPS – 70% Complete

Simulator

- Discussing need for “hardware in the loop” simulator
- Van is investigating software emulator
- Ken will be developing board tester

S30 & S26 BLEPS

- S30
  - Received requirements Nov 04
  - Still need to write code
  - Ready for beam in A Hutch Feb 14-15
- S26
  - Received requirements Dec. 23, 04
  - Still need to install hardware and write code
  - Ready for beam in A Hutch Feb 28 - Mar 1

DIW LOVE Controllers

- Still using LOVE controllers for S30 and S26
- Will develop replacement solution before next Gen3 install

Gen 3's Future

- I'm Comfortable
- Engineers are comfortable
- It's an excellent product

- What do you think?